WHAT IS CLAIMED IS:

1. Isolated DNA coding for the *Mse*I restriction endonuclease, wherein the isolated DNA is obtainable from *Micrococcus species*.

2. A recombinant DNA vector comprising a vector into which a DNA segment coding for the *Mse*I restriction endonuclease has been inserted.

3. Isolated DNA coding for the *Mse*I restriction endonuclease and methylase, wherein the isolated DNA is obtainable from ATCC No. PTA-2421.

4. A cloning vector which comprises the isolated DNA of claim 3.

5. A host cell transformed by the cloning vector of claim 2 or 4.

6. A method of producing the *Mse*I restriction endonuclease comprising culturing a host cell transformed with the vector of claim 2 or 4 under conditions suitable for expression of said endonuclease.

7. A method for producing a target restriction endonuclease, which method comprises:

(a) isolating a gene coding for a protective modification methyltransferase;

(b) obtaining an expression construct for the modification methyltransferase gene that allows complete protection of the host microorganism at substantially all growth phases, without leading to toxicity;

(c) isolating a gene for the cognate restriction endonuclease;

(d) placing the restriction endonuclease gene of step (c) into an expression vector; and

(e) combining the vector of step (d) with the vector of step (b) in a suitable hose such that the combined vectors can be stably and reproducibly reisolated from storage in an expression-competent form.

8. The method of claim 7, wherein the growth phases examined of step (b) are selected from one or more of the group consisting of the logarithmic phase, stationary phase, a resting state achieved by starvation for carbon or nitrogen or other essential nutrient, a phase in which cells are in a special physiological state or in a phase in the presence of physiological insults.

9. The method of claim 7, in which step (b) comprises identifying regulatory elements capable of driving expression of the methyltransferase gene during said growth phases and placing these elements at an appropriate location in the expression construct.

10. The method of claim 9, in which selection is imposed by digesting pooled preparations of the vector with the target restriction endonuclease.

11. The method of claim 7, in which the expression vector is selected from pUC19, pBluescript, pGEM, pRRS, pBR322 or from among moderate copy vectors selected from pACYC4, pSC101, or equivalents or from among unit copy vectors selected from F or pBELOBac11 or P1 or P1 or equivalents or from among vectors expressing target proteins from foreign promoters such as the T7 promoter selected from pET3a, pET21d or similar plasmids or vectors designed to provide very low basal expressions.

12. The method of claim 11, in which the expression vector comprises a vector with low basal expression.

13. The method of claim 12, in which the expression vector includes a T7 RNA polymerase promoter.

14. The method of claim 13, in which the expression vector includes a lambda CI-regulates vector in the opposite sense to the expression promoter.

15. The method of claim 14, in which the expression vector is pVR24.